

Life History of a Foliar Nematode  
(Aphelenchoides ritzema-bosi) on Chrysanthemum

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Plant Invasion

Foliar nematodes infest the plant by coming from the soil (Fig. 1-A) when the plant is wet with dew, rain, or irrigation water and swimming onto the stem or onto leaves touching the soil (Fig. 1-B), or by an infested leaf, touching an uninfested one. Some chrysanthemum cuttings are infested with foliar nematodes when planted.

Migration

Nematodes not already on a leaf may migrate up the stem to a leaf (Fig. 1-C). Foliar nematodes can swim 6 inches up the stem overnight. They have been recorded moving 20 mm in one minute.

Leaf Entry

Once on a leaf the nematodes are active on the water film but do not enter the leaf until almost all the water film evaporates causing the nematode to move slowly. Nematodes pass through the stoma in 3 to 4 seconds (Fig. 1-D).

Life Cycle

Inside the leaf (Fig. 1-E), the adult nematode feeds on parenchyma and palisade cells. After 2 days about two eggs per day are laid. Egg clusters in the leaf contain 25 to 30 eggs. Larvae develop to females in 7 to 10 days. Females lay eggs one to two days after maturity. The life cycle takes 10 to 13 days.

Exodus

Populations of foliar nematode build up to large numbers in leaves. After rain or irrigation, the nematodes emerge in large numbers and swim on the plant surface. A second watering shortly after the first washes the nematodes down the plant and onto the soil. Nematodes also reach the soil by dropping off the leaf (Fig. 1-F) or by inhabiting infected plants that drop on the soil.

Survival

Adult females and late stage larvae resist adverse conditions and are able to infest new plants. Young larvae and males rarely survive adverse conditions. Nematodes survive in dried leaves 20 to 25 months; they live only 1 to 2 months in soil. Some nematodes survive in buds and growing points of overwintering plants.

Damage (Inner leaf)

Inside-the-leaf areas near the nematode turn brown, as browning increases chloroplasts are reduced. Browning reaches epidermis, mesophyll cells rupture, cell walls break down, and large spaces appear in the mesophyll. In the final stages the epidermis breaks down and the leaf shrinks.

Symptoms

Leaves are discolored shortly after invasion. Small greenish-brown patches appear and enlarge until they are enclosed by the veins. The affected area blackens and enlarges but stays within the vein boundaries (Fig. 1-G). The lower leaves droop, turn brownish-black, and fall off from bottom to top (Fig. 1-H). Shoots turn brown and die. Ladderlike brown scars may appear on the stem.

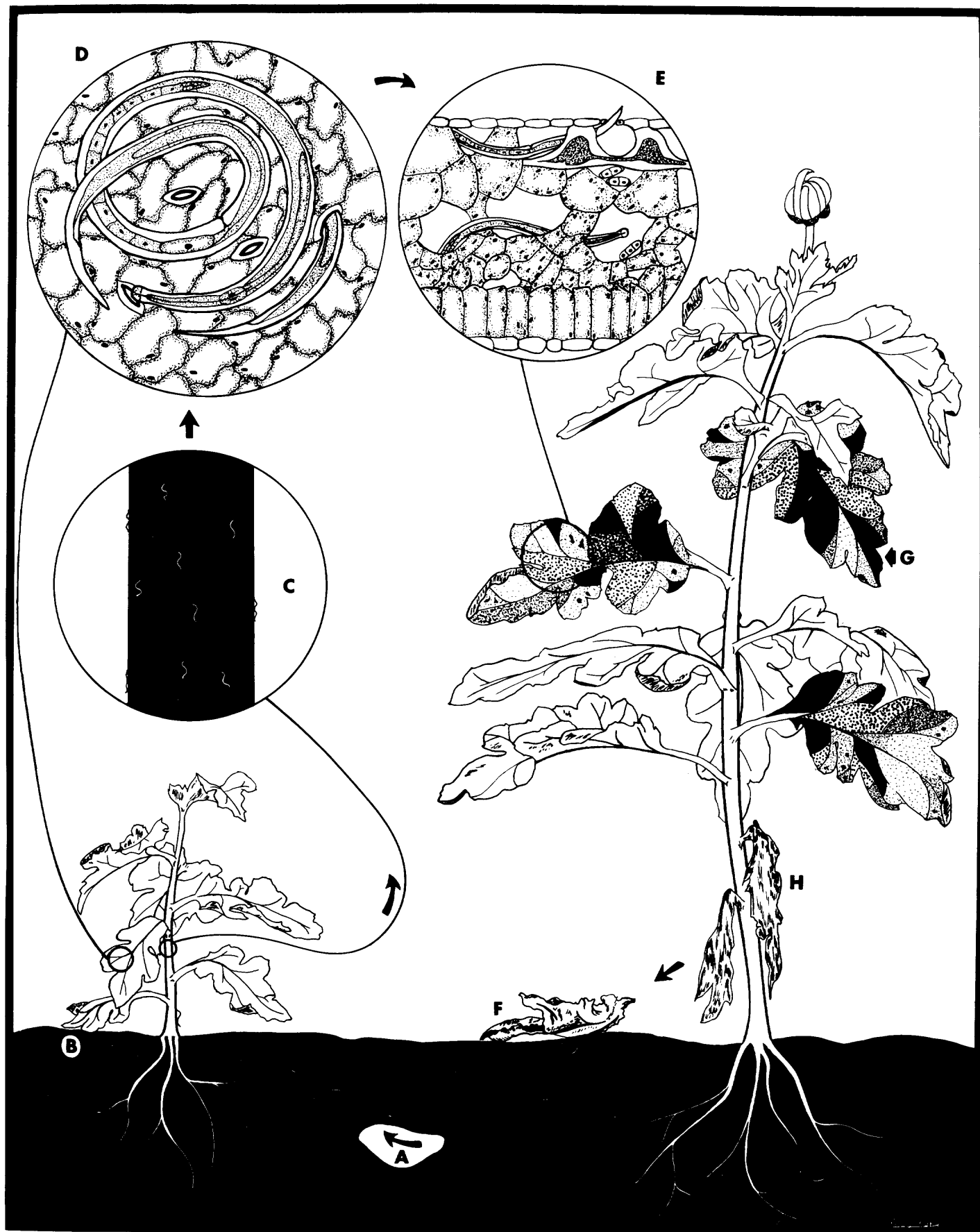


Fig. 1-(A) Nematodes migrate from soil to young plants; (B) nematodes enter leaf touching soil; (C) nematodes move up stem; (D) nematodes enter leaf stomata; (E) nematodes migrate in leaf; (F) nematodes migrate into soil from infested leaf; (G) leaf symptoms; (H) leaves killed by nematodes. (Fig. C and D are in correct proportion of nematode size to the plant part shown). Drawing by Gail Freybourg.